REMARKS/ARGUMENTS

Claims 1-4, 6-8, 10, and 13-15 are pending. Minor revisions have been made to Claims 2, 4, 7, 8, 10, 13 and 15. Support for the amendment to Claim 14 is found on page 20, line 5, of the specification. Accordingly, the Applicants do not believe that any new matter has been added.

The Applicants thank Examiner Weiner for the courteous and helpful discussion of October 6, 2004. The Applicants were encouraged to make minor editorial revisions to improve the clarity of the claims. Use of the terminology "amu" or atomic mass unit was discussed to address the rejection of Claim 8. The Applicants urged that the present invention is directed to a liquid electrolyte distinguishable from the gel-type electrolytes of the prior art, and reviewed the superior properties provided by the highly viscous liquid electrolytes of the invention. The Examiner recommended that the Applicants explain the physical differences between gel and liquid electrolytes to help address the prior art rejections.

Rejection—35 U.S.C.§112, second paragraph

Claims 7, 8 and 14 were rejected under 35 U.S.C. 112, second paragraph, as indefinite. This rejection is moot in view of the amendments above.

Rejection—35 U.S.C. §102

Claim 1 was rejected under 35 U.S.C. 102(b) as being anticipated by Kolb, et al., U.S. Patent No. 6,080,282. Kolb does not anticipate Claim 1, because it does not disclose a nonaqueous fluid electrolyte having a viscosity at 20°C of 7 cP to 30,000 cP. The Kolb electrolyte is a gel and not a fluid. A fluid is required by the present invention.

Kolb is directed to thermoset gel electrolytes, see col. 2, lines 13-21, which indicates that "The present invention is directed to an electrolytic solution for use as a thermoset gel electrolyte in an electrolytic cell." However, the pending claims are directed to a "liquid electrolyte". During the recent interview the Examiner queried whether a gel and highly viscous liquid would be essentially identical. The Applicants further explain the physical and functional differences between a gel and liquid.

A gel is a distinct solid-state physical form because gel has no viscosity, but is itself a self-supporting structure having compression strength. On the other hand, while a liquid has viscosity, it has no mechanical strength.

While Kolb, col. 7, lines 16-29, discloses two PMMAs which are solutions which have viscosities of 2733 or 1742 cps, in Kolb a hardening agent (PHOTOMER or DAROCUR), col. 6, line 3-col. 7, line 10, is added to set the solutions to gel. This is shown in the exemplary formulations in Table 1 (col. 6) of Kolb, which each contain a hardening agent such as PHOTOMER 4050, PHTOMER 4158 or DAROCUR 1173. Table 2 of Kolb (col. 6) shows the compression strength of each gel sample. Clearly Kolb refers to gels having mechanical or compression strength and not to liquids which do not.

The differences between the liquid electrolyte of the present invention and the thermoset polymerized gel electrolyte of Kolb are also more evident from the following excerpt (Kolb, col. 2, line 59-col. 3, line 3):

> The present invention is also directed to a process for making a thermoset polymer gel electrolyte for use in an electrolytic cell. Initially, the above described electrolytic solution is formed. This electrolytic solution is then applied by an electrolyte applicator onto a first electrode material. After application, the electrolyte and first electrode may be cured by conventional techniques such as heat, light, IR radiation or UV radiation. The polymerizable portion of the applied electrolytic solution is polymerized, thus forming a thermoset electrolyte gel. Notably, the reinforcement polymer (PMMA) is not polymerized, thus remaining in solution in the structure of the electrolytic gel.
>
> Next, a second electrode material is applied onto the electrolyte gel. If the electrolyte is only partially cured, the electrolytic cell

> components would be subjected to further curing. Finally, the fabricated electrolytic cell, comprising a first electrode, a first active material, an electrolyte gel, a second electrode, and a second active material is collected for storage and/or use.
>
> The thermoset electrolyte gel of the current invention shows increased mechanical properties over prior thermoset electrolyte gels. In particular, the current electrolyte gel shows increased compressive strength, and a relative low compressive modulus, relative to such prior art electrolytes.

Unlike the liquid electrolyte of the invention, the Kolb electrolyte is polymerized and cured to form a thermoset electrolyte gel having increased mechanical properties, notably increased compressive strength. Accordingly, in view of the structural and functional differences between the prior art polymerized thermoset gel and the liquid electrolyte of the present invention, the Applicants respectfully request that this rejection be withdrawn.

Rejection—35 U.S.C. §103

Claims 2-4 and 6 were rejected under 35 U.S.C. 103(a) as being unpatentable over Kolb, et al., U.S. Patent No. 6,080,282. As discussed above, Kolb is directed to a polymerized thermoset gel electrolyte which is structurally distinct from the liquid electrode of the present invention.

Moreover, there is no suggestion in Kolb for a liquid electrolyte having a viscosity of 7 cP to 30,000 cP. As shown in the specification and as discussed in the prior Response (see e.g., pages 6-7), the liquid electrolytes of the present invention exhibit superior properties to prior art electrolytes, such as gel-type electrolytes.

Accordingly, in view of the structural and functional differences between the prior art polymerized thermoset gel of Kolb and the liquid electrolyte of the present invention, and in view of the superior properties exhibited by the liquid electrolytes of the present invention, the Applicants respectfully request that this rejection be withdrawn.

Rejection—35 U.S.C. §103

Claims 7, 8, 10, and 12-15 were rejected under 35 U.S.C. 103(a) as being unpatentable over Kolb, et al., U.S. Patent No. 6,080,282, in view of Sasaki et al., U.S. Patent No. 5,556,721. As discussed above, Kolb is directed to a polymerized thermoset gel electrolyte which is structurally distinct from the liquid electrode of the present invention. Sasaki has been applied as a secondary reference disclosing various battery elements (e.g., negative electrode, positive electrode, nonaqueous electrolyte) and various organic solvents (e.g., gamma-butyrolactone). However, there is no suggestion in Kolb or in Sasaki for a liquid electrolyte having a viscosity of 7 cP to 30,000 cP or reasonable expectation of success for the benefits of such an electrolyte as described in the present specification.

Accordingly, in view of the physical and structural differences between the prior art polymerized thermoset gel of Kolb and the liquid electrolyte of the present invention, and in view of the superior properties exhibited by the liquid electrolytes of the present invention, the Applicants respectfully request that this rejection be withdrawn.

CONCLUSION

In view of the above amendments and remarks, the Applicants respectfully request reconsideration of the rejections of record and submit that this application is now in condition for allowance. Early notification to that effect is earnestly solicited.

Respectfully submitted,

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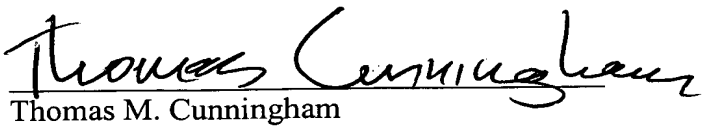

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